MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Permitting and Compliance Division
Water Protection Bureau
P.O. Box 200901
Helena, MT 59620-0901

Permit Fact Sheet
Montana Ground Water Pollution Control System (MGWPCS)

Permittee:	Plum Creek Manufacturing, Inc.
Permit No.:	MTX000092
Receiving Water:	Ground Water

Facility Information

Name:	Plum Creek Manufacturing, Columbia Falls Operations
Mailing Address:	P.O Box 1990 Columbia Falls, MT 59912-1990
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Fee Information

Number of Outfalls: 4

Outfall 003A – Log Pond/Log Yard (Storm water, Process water, water softener backwash, R.O backwash water, catch all for facility)

004A –Wastewater Overflow Area

005A – Plywood Ditch (Veneer dryer wash water)

006A – Boiler Ditch (Boiler blowdown and water softener backwash)

I. PERMIT STATUS

This is a renewal permit for the Plum Creek Manufacturing (PCM) sawmill, plywood plant and medium density fiberboard (MDF) plant. PCM is currently operating under a Montana Ground Water Pollution Control System (MGWPCS) permit MTX000092. The initial permit was issued on September 16, 1996 and expired on October 31, 2001. Since that time, PCM has been operating under an administratively extended permit. PCM submitted a permit application (EPA General Form 1A, received by the Department on January 16, 2003) that identified a total of six outfalls. Supplemental facility information requested by the Department was received on August 18, 2003. On September 25, 2003 the Department notified PCM that their permit had been administratively extended. On May 14, 2004 the permit application was deemed complete by the Department. On April 4, 2005 the Department requested updated application information in accordance with ARM 17.30.1033 (3)(c). On April 26, 2005 the Department received an updated list of facility processes and outfalls. The draft permit is based on the January 16, 2003 application as amended by the August 18, 2003 and April 26, 2005 submittals. PCM is currently operating two class III landfills. PCM is permitted by the Department under MCA 75-10-221. The Class III land fill permits have been renewed and are current for the 2007 permit cycle.

II. FACILITY INFORMATION

A.) Facility Operation Description

PCM, is a timber products processing facility that operates various wood manufacturing processes including sawmills, plywood and medium density fiberboard (MDF) manufacturing, finished wood products, truck/equipment repair shops, and boilers. Processed wastewater, noncontact-cooling water, boiler blowdown, water softener backwash, facility wash down and storm water runoff water are discharged to state water from various sites throughout this facility through a combination of discharge structures. Discharges from PCM are considered continuous with contributory flows varying widely due to the level of plant production, storm event frequency and the number of personnel on site. EPA General Form 1 A indicates SIC codes of 2493 (Reconstituted Wood products), 2436 (Softwood Veneer and Plywood) and 2421 (Sawmill and Planning Mills) as the primary processes at PCM.

B.) Description of Wastewater Generation and Treatment

Based on supplemental permit application materials received by the Department on August 18, 2003, the permittee requested to discharge from the log pond/log yard, MDF plant, west pond A, west pond C, the plywood ditch and the boiler ditch. The log pond/log yard (outfall 003A), wastewater overflow area (outfall 004A), plywood ditch (outfall 005A) and the boiler ditch (outfall 006A) were identified as outfalls in updated supplemental permit application materials received April 26, 2005, and will therefore be covered in the permit renewal. The August 18, 2003 supplemental permit application

materials list west pond A, west pond C and the MDF plant as outfalls. West pond A and west pond C are synthetically lined storage ponds and are not authorized by the Department to discharge. The MDF Pond has been abandoned and replaced with a concrete lined clarifier. The MDF clarifier is not authorized to discharge to state waters. Figure 1 shows the PCM wastewater flows and outfall locations.

PCM consists of the following:

Medium Density Fiberboard Plant:

The MDF plant wastewater sources include; process wastewater, facility wash down water and storm water runoff. The MDF Plant produces the largest volume of process wastewater at PCM, approximately 5.3 million gallons per year (mgy). This estimate was supplied to the Department from PCM prior to construction of the clarifier (DEQ 2004). Process wastewater from this facility comes into contact with raw materials, adhesives and additives used in the manufacture of MDF. Urea formaldehyde glue is used in this process. Process wastewater discharged from the MDF plant is drained via pipe to a newly constructed concrete clarifier system. The newly constructed clarifier replaced the MDF pond in the summer of 2004. The 900,000 gallon capacity clarifier removes settable solids and prepares the water for recirculation and reuse in the MDF facility. Reuse includes use as refiner dilution water and as make up water for the wet electrostatic precipitator and biofilter. The MDF plant recycles 100% of the wastewater discharged to the clarifier. The MDF clarifier has the capability to discharge to the log pond during an overflow event.

Boiler Area:

The boiler area discharges boiler blow down, reverse osmosis (RO) concentrate, water softener backwash and fly ash wash down water to the boiler ditch (outfall 006A). Boiler blow down is generated from solids condensing in supply water heated in the boilers, at a rate of approximately 10-15 gpm. PCM employs both a gas boiler and a hog fuel boiler. The reverse osmosis system was brought online in January of 2007. This system serves as pretreatment of source water prior to use in the boiler(s). RO concentrate is discharged to the boiler ditch, or it is used in the plywood and MDF processes as make up water. Water softener backwash is a by-product of the water softening process, in which sodium chloride and caustic soda (sodium hydroxide) are added to soften the water. Hog boiler wash down water and fly ash wash down water are also generated in this area. Hog fuel ash is saturated with water and the resulting runoff is allowed to commingle with other wastewater prior to discharge. Approximately 3,000 gpd of fly ash wash down water and hog boiler wash down water are generated (DEQ, Field Investigation Report, May 3, 2007). The wastewater streams from this location are discharged to the boiler ditch and conveyed to the unlined log pond (outfall 003A) for discharge. The boiler facility discharges about 5.1 mgy of untreated wastewater to this ditch (PCM August 12, 2003).

Plywood Plant:

At the plywood plant, logs are steamed, veneer is shaved and dried, plywood is glued, pressed and treated. Discharges from the plywood plant include veneer dryer wash water, ash bunker runoff, restroom sanitary water and storm water runoff. The plywood gluing process involves the application of phenol formaldehyde glue to sheets of veneer, then pressing and drying of the sheets. Plywood treatment processes at this facility include treating plywood with epoxy-based fillers and petroleum based oils. Process wastewater generated from the plywood gluing process is contained in steel lined concrete tanks inside the plant. This wastewater is then recycled and glue is extracted and reused. Process wastewater generated in the veneer dryer areas, from wash down of the dryer areas is discharged to the unlined plywood ditch (Outfall 005A), at a rate of approximately 300,000 gpy (PCM August 12, 2003). Restroom sanitary water (approximately 200,000 gpy) is discharged to a septic system on the south side of the facility (PCM August 12, 2003). Storm water runoff generated in this area is approximately 3.1 mgy, of this 700,000 gpy discharges to the unlined plywood ditch and 2.4 mgy discharges to the unlined log pond (outfall 003A).

Saw Mill and Planer:

The saw mill area discharges storm water, wash down water and restroom sanitary water. Storm water from this area is either conveyed to the groundwater via infiltration or evaporates. A small amount of fresh water is used for cooling saw blades during the lumber making process. Water used for cooling saw blade is allowed to absorb into wood chip and sawdust and is not actively discharged. Storm water from this area is collected in a heavily trafficked depression on the west side of the facility. Wash down water for the Saw Mill and the Planer facility is discharged to the ground surface and allowed to infiltrate. An estimated 10.3 mgy of untreated storm water is collected and discharged in this area (PCM August 12, 2003). Restroom sanitary water is discharged to the Columbia Falls wastewater treatment plant via the sewer system.

Log Pond:

The log pond (Outfall 003A) is a wastewater discharge and storage facility located at the southwestern end of the log yard. This discharge/storage facility is an unlined earthen structure that allows infiltration of wastewater. This facility is used to collect and retain storm water, process wastewater from outfall 006A, and runoff from the log yard, raw materials area, the northern log storage areas and overflow from the clarifier. The log pond also acts as a distribution pond for wastewater stored in west pond A and west pond C. In times of increased supply of wastewater, water from the log pond is pumped to west pond A or west pond C for passive treatment or redistribution and use and to the wastewater overflow area for discharge to groundwater. PCM uses wastewater from the log pond, west pond A and west pond C for dust control on facility road ways.

Log Yard:

The log yards are used for storing logs prior to processing. The southern log yard area is approximately twenty-five (25) acres in size. Wastewater stored in the log pond is used to wet the logs stored here. Wastewater is sprayed on the logs at a rate of approximately 500-900 gpm from April through October. Runoff from log watering flows through the log stacks and accumulates on the ground surface and either infiltrates into the ground or runs off to the unlined infiltration ditches surrounding the yard and is conveyed back to the log pond. The northern log yard established in May 2007 is approximately 6 acres in size. Water used in this area is stored in a new log pond adjacent to the log yard. Source water for the log pond is from a source well east of the boiler facility, storm water runoff and log deck runoff.

Wastewater Overflow:

The wastewater overflow (outfall 004A) is an unlined catchment approximately 1,000 ft in length by 800 ft in width. This area is capable of receiving wastewater from the log pond, west pond A or west pond C. Wastewater is pumped to the overflow area and is discharged to ground water through infiltration. The PCM environmental engineer informed Department personnel that this area is only used 2-3 times per year (DEQ 2007, Field Investigation Report).

Truck Shop Area:

The Truck Shop area collects and discharges storm water. This area is surrounded by an earthen berm. Inside this berm are a vehicle maintenance facility, metal fabrication shop and an equipment wash area. Storm water runoff from this area collects in a swale at the northwest corner of the Truck Shop. The swale has no lining thereby allowing runoff to infiltrate into the ground. Approximately 300,000 gpy of storm water runoff is generated from this area (PCM August 12, 2003). Equipment wash wastewater generated here is reported to be captured in a concrete basin and pumped to an oil/water separator. A used oil reclaimer removes the retained oil, and the remaining water is sent to the City of Columbia Falls wastewater treatment plant via the sewer system.

C.) Receiving Waters

The shallowest groundwater encountered in the immediate area of PCM occurs 10-20 ft below land surface (Olympic Technical Services, 2003). The average total depth and static water levels in Township 30N, Range 20W, Section 8 were reported as 124.9 (ft) and 81.99 (ft respectively). This, the most current hydrogeologic information, comes from local geological and hydrogeological maps provided by the Montana Bureau of Mines and Geology (http://mbmggwic.mtech.edu/sqlserver/v11/data/dataGeographic.asp?pagename=&report=w10&Township=30N&Range=20W&section=8&SortOrder=trs&repLink=ON&Submit1=Retrieve). This also agrees with potentiometric maps developed by the DEQs Source

Water Program (DEQ 2003). Geologic maps indicate the dominant geology of the area is glacial outwash deposits. These deposits consist of stratified gravels, sand, and silt; clasts of calcareous siltite, quartzite, intrusive igneous rocks, sandstone and siltstone; well stratified, chanalized and cross-stratified with lenticular beds of imbricated cobbles and pebbles. The average thickness of this unit is approximately 50ft, and locally, more than 140 ft. Ground water commonly occurs near the surface and this unit produces significant quantities of water. Ground water is the source for domestic water supplies in the area.

D.) Effluent Characteristics

Appendix A shows analytical results from sampling conducted at each of the outfalls. Analytical results for outfalls 003A, 004A, 005A and 006A are incorporated into Appendix A, Table A-1, Table A-2, Table A-3 and Table A-4 respectively. Section III subpart C further discusses monitoring results from each outfall.

The permittee submitted permit application form EPA 2C (PCM January 16, 2003) where they identified pollutants that were known to be in the effluent or are believed to be discharged from outfalls at their facility. These included Formaldehyde (phenol formaldehyde and urea formaldehyde) and Xylene. Formaldehyde is present in glues used in the manufacturing of MFD and plywood. Xylene is present in petroleum and petroleum products. The August 18, 2003 supplemental information contained analytical data documenting the presence of formaldehyde in wastewaters generated at PCM. Samples collected by PCM on May 4, 2003 and analyzed by two separate labs indicate the presence of formaldehyde in west pond A, the field pond (wastewater overflow area), the MDF pond and the log pond.

Formaldehyde is used at multiple locations on site. It is used in differing concentrations in adhesives for the production of MDF and Plywood. Depending on the additives (e.g. urea and phenol) formaldehyde will have differing affects on the environment. Because of its good solubility, some 99% of the formaldehyde, which is released into the environment, is found in water (BMFJG 1984).

Outfall 003A (Log Pond)

Wastewater discharged at Outfall 003A is characterized by Discharge Monitoring Report (DMR) data submitted to the Department for the period of record from January 2003 through December 2006. This data is presented in Appendix A, Table A-1. Outfall 003A is located at 48°22’30.4’’ North latitude (45.37511) and 114°12’18.4’’ West longitude (–114.20511).

Outfall 004A (Wastewater Overflow Area)

Wastewater discharged at Outfall 004A is characterized by DMR data submitted to the Department for the period of record from January 2003 through December 2006. DMR

data is presented in Appendix A, Table A-2. Outfall 004A is located at 48°22'42.4'' North latitude (45.37844) and 114°12'32.6'' West longitude (–114.20906).

Outfall 005A (Plywood Ditch)

The permittee submitted analytical results for outfall 005A wastewater effluent quality with the permit application. The Department collected wastewater samples from Outfall 005A on May 31, 2007. This data is presented in Appendix A, Table A-3. Outfall 005A is located at 48°22'37.0'' North latitude (48.37694) and 114°11'40.1'' West longitude (–114.19447).

Outfall 006A (Boiler Ditch)

The permittee submitted analytical results for outfall 006Awastewater effluent quality with the permit application. The Department has also collected effluent samples from Outfall 006A, on May 31, 2007. This data is presented in Appendix A, Table A-4. Outfall 006A is located at 48°22'34.5'' North latitude (48.37625) and 114°11'57.7'' West longitude (–114.19936).

On June 20, 2005 the Department conducted an inspection to gather information pertinent to drafting the MGWPCS permit. Department personnel recorded pH measurements in the discharge to the Boiler Ditch, at the end of the "west" boiler blowdown culvert. Field readings from the calibrated meter indicated a one time pH of 12.1 s.u. A liquid waste with a pH equal to or greater than 12.5 is regulated as a hazardous waste.

E.) Compliance/ Inspection History

On June 24, 2003 the Department conducted a routine compliance inspection at PCM. Ground water samples were collected from a monitoring well down gradient of the MDF plant. Monitoring results indicated elevated levels of Volatile Organic Compounds (VOC) and carbonal compounds, including formaldehyde, acetaldehyde and benzaldehyde. The list of parameters analyzed during this inspection and the resulting concentrations can be found in Appendix A, Table A-5. During this inspection the Department documented storm water conveyance structures that in general were not maintained. Department personnel documented clogged, deteriorating and non functional culverts, large areas of standing water containing wood wastes as well as commingling of process wastewater with storm water (DEQ Field Investigation Report 2003).

On June 20, 2005 the Department conducted a compliance inspection at PCM. During the inspection the pH level in the boiler ditch was recorded at 10.38s.u, the pH level in the plywood ditch water was 12.1 s.u. (DEQ Field Investigation Report 2005). A liquid waste with a pH equal to or greater than 12.5 is regulated as a hazardous waste. Department personnel documented clogged, deteriorating and non functional culverts, large areas of standing water containing wood wastes as well as commingling of process wastewater with storm water (DEQ Field Investigation Report 2005).

The Department conducted a compliance inspection on May 31, 2007. PCM was found to be in violation of Section H of MGWPCS permit number MTX00092. PCM was cited for failure to notify the Department of facility changes for construction of a 600,000 gallon clarifier addition. PCM contested this violation. Wastewater samples were collected during this inspection. Wastewater analytical results for outfalls 005A and 006A are incorporated into Appendix A, Table A-3 and Table A-4 respectively. Department personnel documented clogged, deteriorating and non functional culverts, large areas of standing water containing wood wastes as well as commingling of process wastewater with storm water (DEQ Field Investigation Report 2007). The Department recommended that PCM implement a storm water pollution prevention plan as a result of this inspection. An Extractable Petroleum Hydrocarbon Screen was conducted at west pond A, and reported a Total Extractable Hydrocarbon (TEH) concentration of 1.80. This sample was further fractionated and reported a TEH of 0.88 mg/L (DEQ Field Investigation Report 2007). PCM has not disclosed any processes in the manufacture of MDF, plywood or dimensional lumber that uses or could cause petroleum hydrocarbons to be present or be a byproduct of the production process.

III. PROPOSED DISCHARGE LIMITS AND CONDITIONS

A.) Scope and Authority

The Montana Water Quality Act (Act) states that it is unlawful to discharge sewage, industrial waste or other wastes into any state water without a current permit from the Department (75-5-605(2), MCA). The Act establishes that rules shall be adopted governing the application, authorization and issuance of permits to discharge sewage, industrial wastes or other wastes to state waters; provided the limitation of said permits will not result in pollution of any state waters; (75-5-401(1) and (2) MCA). ARM 17.30.1031 states that all issued MGWPCS permits must contain conditions including, but not limited to, discharge limitations, which will assure compliance with the ground water standards, given due consideration to the economics of waste treatment and prevention. ARM 17.30.1005(1) states the standards of ARM 17.30.1006 establish the maximum allowable changes in ground water quality and are the basis for limiting discharges to ground water.

B.) Receiving Waters

During the last permit cycle, PCM collected and reported quarterly ground water monitoring data and submitted it to the Department in the form of a Discharge Monitoring Reports (DMR). Ground water quality data was collected at one (1) monitoring well upgradient of the facility (MW-2) and four (4) monitoring wells down gradient from the facility. PCM reported Specific Conductance, pH, Total Ammonia as N, Total Kjeldahl Nitrogen (TKN), Nitrite Nitrate as N, Chloride and Total Dissolved Solids (TDS).

Table 1 shows the results of the last three (3) quarterly sampling events from the upgradient monitoring well MW-2. Monitoring well MW-2 is located approximately 400 ft down gradient of PCM's Class III land fill and immediately adjacent to west pond A. Water quality data from MW-2 indicates elevated levels of nitrates, ammonia, chloride and TDS.

Table 1: MW-2 Up Gradient Ground Water Quality Analysis

Parameter	Minimum Value (mg/L)	Maximum Value (mg/L)	Average value (mg/L)
Specific Conductance	541	992	756
pH	7.1	7.4	7.24
Ammonia	4.5	14.1	9.15
Total Kjeldahl Nitrogen	5.3	17.5	11.28
Nitrate Nitrite as N	1.17	8.8	4.12
Chloride	28	68	41.8
Total Dissolved Solids	460	561	484

PCM was required to monitor down gradient water quality as a permit condition of the existing permit. Table B-1 in Appendix B shows the results of the last five (5) years of quarterly sampling events from the down gradient monitoring wells (MW-1, MW-3A, MW-4 and MW-5, MW). Monitoring well MW-1 is located approximately 200 ft up gradient and northeast of west pond C. MW-3A is located approximately 100 ft down gradient and southwest of west pond A. MW-4 no longer exists. This well was removed during construction of the new MDF Clarifier. Well data from this well is for the time period prior to removal of the MDF pond. M MW-5 is located immediately south of the log pod. Water quality data from MW-1, MW-3A, MW-4 and MW-5 indicated elevated levels of Chloride, TDS, Nitrogen and Specific Conductivity.

C) Applicable Water Quality Standards

Water quality data was collected from an up gradient well (MW-2). The maximum specific conductance reported to the Department was 992 µmhos/cm, the average value was 756 µmhos/cm. Human health standards listed in DEQ-7 apply to concentrations of dissolved substances in Class I ground waters with a specific conductance of less than or equal to 1,000 µmhos/cm. The receiving waters are therefore classified as Class I groundwater as defined by ARM 17.30.1006 (1)(a). The quality of class I ground water must be maintained so that this water will remain suitable for:

1. Public and private water supplies,
2. Culinary and food processing, irrigation,
3. Drinking water for live stock and wildlife and
4. Commercial and industrial purposes.

In order to maintain these beneficial uses, a person may not cause a violation of any of the following specific water standards listed below except within a Department authorized mixing zone (ARM 17.30.1006(1)(b)):

1. The human health standards listed in Department Circular DEQ -7 (January 2006). For concentrations of parameters for which human health standards are not listed in Circular DEQ –7, no increase of a parameter to a level that renders the waters harmful, detrimental, or injurious to the beneficial uses listed for Class I water;
2. General water quality requisite to support designated beneficial uses listed above and/or;
3. The states nondegradation policy 75-5-303 MCA.

The discharges from PCM which contains measured levels of pollutants for which there are no numeric water quality standards include total dissolved solids (TDS), sulfate, chloride, pH, iron and manganese. ARM 17.30.1006(1)(ii) is a narrative standard which states that the concentration of a parameter may not increase to a level that renders the water harmful, detrimental, or injurious to the designated use. Class I ground water must be maintained suitable for drinking water supply (public and private) and culinary and food processing purposes, with little or no treatment. Section (1) (ii) of this rule, states that the Department may use any pertinent credible information to determine these levels. The Department will use National Secondary Drinking Water Regulations (40 CFR 143) where applicable to establish permit effluent limit to protect this beneficial use of class I ground water.

Montana's Nondegradation Policy applies to any activity of man which may result in a new or increased source which may cause degradation (ARM 17.30.705(1). The proposed discharge is not a new or increased source pursuant to ARM 17.30.702 (18). Therefore nondegradation policy dose not apply to discharges from PCM.

Outfall 003A and 004A

Outfall 003A (Log Pond/Log Yard) discharges wastewater collected from the boiler ditch, storm water and runoff from the log decks. The wastewater discharged to the boiler ditch consists of commingled boiler blow down, water softener backwash, RO concentrate, fly ash wash down water and hog fuel boiler wash down water. Effluent quality monitoring data collected by PCM from Jan 1, 2003 to Dec 31, 2006 for outfall 003A (Appendix A, Table A-1) indicates elevated levels of TDS, pH, Specific Conductivity, Chloride and Total Ammonia as N.

Outfall 004A (wastewater overflow area) is capable of discharging wastewater from the log pond, west pond A and west pond C. These ponds collect, store and discharge wastewater originating from the boiler ditch. This wastewater stream consists of commingled boiler blow down, water softener backwash, RO concentrate, fly ash wash down water and hog fuel boiler wash down water, storm water runoff and log deck

runoff. Monitoring data for outfall 004A wastewater collected from Jan 1, 2003 to Dec 31, 2006 (Appendix A, Table A-2) indicates elevated levels of TDS, pH, Specific Conductivity, Chloride and Total Ammonia as N.

Numeric Human Health Standards for ground water for the parameters TDS, pH, Chloride, Specific Conductivity and Total Ammonia as N are not listed in DEQ-7 (2006). ARM 17.30.1006 states that there shall be no increase of a parameter to a level that renders the water harmful, detrimental or injurious to the beneficial uses listed for class I water (ARM 17.30.1006 (1)(a). ARM 17.30.1006 (1)(a) states that the Department may use any pertinent credible information to determine the levels that render the waters harmful, detrimental or injurious to the beneficial uses.

The most sensitive beneficial use for Class I waters is the use as a public and private drinking water supply. 40 CFR 143.3 lists TDS, pH and Chloride as having 500 mg/L, 6.5-8.5 su and 250 mg/L secondary maximum contaminant levels (SMCLs), respectively. These SMCLs represent "reasonable goals for drinking water" (40 CFR 143.3). Therefore, pursuant to ARM 17.30.1006(1)(a), the Department has determined that a discharge of effluent that exceeds the SMCLs, can limit existing and future beneficial uses. Thus, a discharge that results in an exceedence of a SMCL at the point of discharge to ground water do not comply with the lowest applicable standard. For those parameters not listed in DEQ-7, the National Primary Drinking Water Standards or as SMCL's the Department will require that PCM not discharge wastewater with concentrations of these or other parameters that will limit beneficial uses.

Outfall 005A

Outfall 005A (plywood ditch) discharges wastewater that includes veneer dryer wash water, ash bunker runoff and storm water runoff. Monitoring data for outfall 005A indicates elevated levels of pH, TDS, TSS, BOD, Oil and Grease, Phosphorus, Nitrate plus Nitrite, Sulfate, Iron, Aluminum, Zinc, Barium, Arsenic, Cadmium and Total Phenols. The Department considers the wastewater stream being discharged at outfall 005A process wastewater (as defined in 40 CFR 401.11 and 429.11(c)) as it comes into contact with raw materials.

Numeric Human Health Standards for ground water for the parameters pH, TDS, TSS, BOD, Oil and Grease, Phosphorous, Sulfate, Iron and Aluminum are not listed in DEQ-7 (2006). ARM 17.30.1006 states that there shall be no increase of a parameter to a level that renders the water harmful, detrimental or injurious to the beneficial uses listed for class I water (ARM 17.30.1006 (1)(a). ARM 17.30.1006 (1)(a) also states that the Department may use any pertinent credible information to determine the levels that render the waters harmful, detrimental or injurious to the beneficial uses.

The most sensitive beneficial use for class one waters is drinking water. DEQ -7 lists Human Health Standard for ground water for Nitrate plus Nitrite, Arsenic, Cadmium and Phenol as 10 mg/L, 0.10 mg/L, 0.005 and 0.3 mg/L respectively. DEQ-7 states that

Human Health Standards are values that no surface water of ground water value shall exceed. 40 CFR 143.3 lists pH, Sulfate, Iron, Cadmium and Aluminum as having 6.5-8.5 su, 250 mg/L, 0.3 mg/L and 0.05-0.2 mg/L secondary maximum contaminant levels (SMCLs), respectively. SMCLs represent "reasonable goals for drinking water" (40 CFR 143.3). Therefore, pursuant to ARM 17.30.1006(1)(a), the Department has determined that a discharge of effluent that exceeds the SMCLs or Human Health Standard, limits potential beneficial uses. Thus, discharges that results in an excursion from the SMCLs or the Human Health Standards at the point of discharge to ground water do not comply with the lowest applicable standard.

For those paramters not listed in DEQ-7, the National Primary Drinking Water Standards or as SMCL's, the Department will require that PCM not discharge wastewater with concentrations of these or other parameters that will limit beneficial uses.

Outfall 006A

The wastewater discharged to Outfall 006A (boiler ditch) consists of commingled boiler blow down, water softener backwash, RO concentrate, fly ash wash down water and hog fuel boiler wash down water. PCM submitted technical information characterizing RO backwash water effluent. This information provided by the manufacturer indicates effluent with high concentrations of TDS. RO system backwash water contains elevated concentrations of metals and other parameters that are a result of this technology. Additives to the boiler include Sodium Bisulfate, and Sodium Hydroxide. These additions will elevate the levels of sodium (Na). Based on previous monitoring data at outfall 006A, wastewater is known to contain elevated levels of TDS, pH, Total Ammonia as N, Sulfate, Iron, Aluminum, Barium, Oil and Grease, BOD, TSS, TDS, Phosphorus, Zinc and Toluene.

Numeric standards for pH, TDS, TSS, BOD, Oil and Grease, Phosphorous, Ammonia, Sulfate, Iron and Aluminum are not listed in DEQ-7 (2006). Ground water quality standards of ARM 17.30.1006 states that no increase of a parameter to a level that renders the water harmful, detrimental or injurious to the beneficial uses listed for class I water (ARM 17.30.1006 (1)(a) are allowed. ARM 17.30.1006 (1)(a) also states that the Department may use any pertinent credible information to determine the levels that render the waters harmful, detrimental or injurious to the beneficial uses.

The most sensitive beneficial use for class I waters is the use as a public of private drinking water supply. DEQ -7 lists Human Health Standard for ground water for Nitrate plus Nitrite, Zinc, Arsenic, Cadmium and Toluene as 10 mg/L, 2.0 mg/L, 0.010 mg/L, 0.005 mg/L and 0.1 mg/L respectively. Human Health Standards in DEQ-7 are values that no surface water or ground water value shall exceed. 40 CFR 143.3 lists pH, Sulfate, Iron, Aluminum and Manganese as having 6.5-8.5 su, 250mg/L, 0.3 mg/L, 0.05-0.2 mg/L and 0.050 secondary maximum contaminant levels (SMCLs), respectively. These SMCLs represent "reasonable goals for drinking water" (40 CFR 143.3). Therefore, pursuant to ARM 17.30.1006(1)(a), the Department has determined that discharge of

effluent that does not exceed the SMCL, does not limit potential beneficial uses. Thus, discharges that results in an exceedence of SMCLs, at the end of pipe, do not comply with the most stringent applicable standard.

For those parameters not listed in DEQ-7, the National Primary Drinking Water Standards or as SMCL's, the Department will require that PCM not discharge wastewater with concentrations of these or other parameters that will limit beneficial uses

IV. FINAL EFFLLUENT LIMITS

Final effluent limits are based on the lowest applicable standards identified in Section III. B. Based on the discussion in Section III.B and pursuant to MCA 75-5-402 (3), ARM 17.30.1031(2) and ARM 17.30.1006 (1)(a), the Department will implement limits such that the discharges from outfalls 003A, 004A, 005A and 006A shall not cause increases of any parameter to a level that renders the water harmful, detrimental or injurious to the beneficial uses listed for class I water. The Department has established numeric and narrative effluent limits at the point of discharge and at the end of ground water mixing zones for outfalls 003A, 004A, 005A and 006A. The permittee will be required to monitor effluent volume, effluent quality and ground water quality to ensure compliance with the applicable standards.

A.) Final Effluent Limits

Outfall 003A

The Department requires numeric and narrative limits for outfall 003A. Numeric effluent limits consist of those parameters listed in Table 2 and are based on the discussion in Section III. C, and pursuant to MCA 75-5-402 (3), ARM 17.30.1031(2) and ARM 17.30.1006 (1)(a). The Department also proposes a limit for TDS such that the discharge from outfall 003A shall not cause an excursion from the SMCL standard for TDS at the end of a standard Department authorized mixing zone. Narrative limits will require that process wastewater (as defined in 40 CFR 401.11 and 429.11 (c)) shall not be discharged from outfall 003A.

Table 2. Outfall 003A Final Effluent Limits

Parameter	Units	Limit	Point of Compliance	Rationale
pH	**s.u**	6.5-8.5	Intake for the log deck watering pumps	SMCL
Chloride	**mg/L**	250	Intake for the log deck watering pumps	SMCL

Sulfate	**mg/L**	250	Intake for the log deck watering pumps	SMCL

Outfall 004A

The Department requires numeric and narrative limits for outfall 004A. Numeric effluent limits consist of those parameters listed in Table 3 and are based on the discussion in Section III.C, and pursuant to MCA 75-5-402 (3), ARM 17.30.1031(2) and ARM 17.30.1006 (1)(a). The Department also proposes a limit for TDS such that the discharge from outfall 004A shall not cause an excursion from the SMCL standard for TDS at the end of a standard Department authorized mixing zone. Narrative limits will require that process wastewater (as defined in 40 CFR 401.11 and 429.11 (c)) shall not be discharged from outfall 004A.

Table 3. Outfall 004A Final Effluent Limits

Parameter	Units	Limit	Location	Rationale
pH	**s.u**	6.5-8.5	End of Pipe	SMCL
Chloride	**mg/L**	250	End of Pipe	SMCL
Sulfate	**mg/L**	250	End of Pipe	SMCL

Outfall 005A

The Department has proposed numeric and narrative limits for outfall 005A. Numeric effluent limits consist of those parameters listed in Table 4 and are based on the discussion in Section III.C, and pursuant to MCA 75-5-402 (3), ARM 17.30.1031(2) and ARM 17.30.1006 (1)(a). The Department also proposes a limit for TDS such that the discharge from outfall 005A shall not cause an excursion from the standard for TDS at the end of a standard Department authorized mixing zone.

Table 4. Outfall 005A Final Effluent Limits

Parameter	Units	Limit	Location	Rationale
pH	**s.u**	6.5-8.5	In the plywood ditch	SMCL
Iron	**mg/L**	0.3	In the plywood ditch	SMCL
Aluminum	**mg/L**	0.05-0.2	In the plywood ditch	SMCL
Nitrate plus Nitrite	**mg/L**	10	In the plywood ditch	DEQ-7
Zinc	**mg/L**	5	In the plywood ditch	SMCL

Sulfate	**mg/L**	250	In the plywood ditch	SMCL
Arsenic	**mg/L**	0.010	In the plywood ditch	DEQ-7
Cadmium	**mg/L**	0.005	In the plywood ditch	DEQ-7
Total Phenol	**mg/L**	0.3	In the plywood ditch	DEQ-7

Outfall 006A

The Department has proposed numeric and narrative limits for outfall 006A. Numeric effluent limits consist of those parameters listed in Table 4 and are based on the discussion in Section III C, and pursuant to 75-5-402 (3), ARM 17.30.1031(2) and ARM 17.30.1006 (1)(a). The Department also proposes a limit for TDS such that the discharge from outfall 006A shall not cause an excursion from the standard for TDS at the end of a standard Department authorized mixing zone. Due to the nature of the discharge from outfall 006A (boiler blow down), the Department will allow a grace period of one year from the effective date of the permit to achieve compliance with the pH limits.

Table 5. Outfall 006A Final Effluent Limits

Parameter	Units	Limit	Location	Rationale
pH	**s.u**	6.5-8.5	At the end of pipe prior to discharge into the boiler ditch	SMCL
Sulfate	**mg/L**	250	At the end of pipe prior to discharge into the boiler ditch	SMCL
Iron	**mg/L**	0.3	At the end of pipe prior to discharge into the boiler ditch	SMCL
Aluminum	**mg/L**	0.05-0.2	At the end of pipe prior to discharge into the boiler ditch	SMCL
Zinc	**mg/L**	5	At the end of pipe prior to discharge into the boiler ditch	SMCL
Arsenic	**mg/L**	0.010	At the end of pipe prior to discharge into the boiler ditch	DEQ-7
Cadmium	**mg/L**	0.005	At the end of pipe prior to discharge into the boiler ditch	DEQ-7

Toluene	**mg/L**	0.1	At the end of pipe prior to discharge into the boiler ditch	DEQ-7
Manganese	**mg/L**	0.050	At the end of pipe prior to discharge into the boiler ditch	SMCL

For those parameters not listed in DEQ-7, the National Primary Drinking Water Standards or as SMCL's the Department will require that PCM not discharge wastewater at any outfall with concentrations of these or other parameters that will limit beneficial uses.

B.) Mixing Zone

According to ARM 17.30.505 it is the Department's responsibility to assess information received from the applicant concerning the biological, chemical and physical characteristics of the receiving water as specified in 17.30.506 to determine if a mixing zone is applicable. PCM did not request a standard or site specific mixing zone, nor was the information required by ARM 17.30.506 to develop a mixing zone submitted to the Department (PCM 2003). Therefore, mixing zones will only be granted for those parameters which can not be regulated at the point of discharge. The SMCL of 500 mg/L for Total Dissolved Solids (TDS) cannot be achieved at the point of discharge because. Therefore, the Department will grant PCM a mixing zone for TDS at each outfall and the permittee will be required to meet the SMCL at the end of each mixing zone.

The concentration of TDS must not exceed 500 mg/L on the down gradient boundary of the mixing zone (ARM 17.30.715 (1) (d) (iii)). The permittee will be required to comply with all applicable ground water quality standards (ARM17.30.508 (1)(a)), (ARM 17.30.1006(1)(a)) at the down-gradient edge of the mixing zone. The permittee must comply with the ground water mixing zone rules pursuant to ARM 17.30 Subchapter 5. Ground water standards may be exceeded within the mixing zone, provided that all existing and future beneficial uses of the state waters are protected (ARM 17.30.1005).

The shape of the mixing zone is determined from the orientation of these outfalls with respect to ground water flow. The permittee has proposed to discharge all wastewater from Outfalls 003A, 004A, 005A and 006A and will be granted standard 500-foot ground water mixing zone for the log pond (outfall 003A), wastewater overflow area(outfall 004A), plywood ditch(outfall 005A), and boiler ditch (outfall 006A), in a S10º W direction. Ground water flow direction was established via potentiometric maps, developed from data collected from multiple monitoring and supply wells within 1,500 feet from the discharge site. Potentiometric maps were submitted by PCM and Olympus Technical Services Inc. as part of monitoring conducted onsite and agree with groundwater flow directions reported on potentiometric maps published by the Montana Bureau of Mines and Geology (Ground Water Atlas of the Flathead Lake Area: Montana

Bureau of Mines and Geology, Ground Water Assessment Report No. 2, Montana Bureau of Mines, 2004).

C.) Prohibition of Discharge of Process Wastewater

The Department must clearly specify in any permit, limitations imposed as to the volume, strength and other significant characteristics of the waste to be discharged MCA 75-5-402 (3). All issued MGWPCS permits must contain special conditions that will assure compliance with the ground water quality standards. These conditions may include the prohibition of certain discharges without prior approval from the Department (ARM 17.30.1031 (4)). For all state waters, existing and anticipated uses and the water quality necessary to protect those uses must be maintained and protected (ARM 17.30.705 (2) (a)). It is the Departments responsibility to ensure that class I waters are maintained for all beneficial uses listed in ARM 17.30.1006. Therefore, the Department is requiring the prohibition of the discharge of all process wastewater. PCM shall cease all discharge of process wastewater from outfalls 003A, 004A, 005A and 006A within two (2) years of the effective date of the permit.

Process wastewater includes all wastewaters generated as part of the manufacture of medium density fiberboard or plywood that come into direct contact with or result from the production or use of any intermediate product, finished product, by product, or waste product, prior to discharge to treatment/storage facilities.

The Department does not consider the runoff from log decks, saw dust piles, chip piles, and bark piles as process waste water, provided these materials have not been processed in any way during manufacture of plywood or MDF. The Department does consider runoff from sawdust piles, or piles of other waste generated during the manufacture of MDF and plywood as process wastewater. The Department considers the discharges from outfalls 003A, 004A, 005A and 006A process wastewater.

VI. Monitoring Requirements

Effluent limits are established to protect ground water from a change in water quality that would cause degradation or limit a beneficial use [ARM 17.30.1006(1)(a)]. Effluent monitoring is essential to ensure compliance with permit limits based on applicable water quality standards, as well as to ensure effective treatment, of the wastewater discharged (ARM 17.30.1031). Figure 1 shows sampling locations for Outfalls 003A, 004A, 005A and 006A.

A.) Effluent Monitoring

Outfall 003A

The permittee shall monitor the effluent for the constituents in Table 6 at the frequencies and with the type of measurement indicated. If no discharge occurs during the entire monitoring period, it shall be stated in a Discharge Monitoring Report that no discharge occurred.

Monitoring of the following effluent parameters is required at the end of pipe for outfall 003A. Sampling of outfall 003A shall take place at or as close as possible to the intake for the log deck watering pump. PCM shall operate aeration equipment for 12 hours prior to sampling to ensure thorough mixing of the effluent pond.

Table 6: Outfall 003A Effluent Self-Monitoring Requirements

Parameter, units	Units	Frequency	Sample Type[2]
Effluent Flow Duration [1]	days	Continuous[3]	Continuous
Effluent Flow Volume, Total [1][5]	gallons	Continuous[3]	Continuous
pH	s.u	1/week[4]	Instantaneous
Specific Conductance	µmhos/cm	1/week	Instantaneous
Total Dissolved Solids	mg/L	1/Month	Grab
Biological Oxygen Demand	mg/L	1/Month	Grab
Total Nitrogen	mg/L	1/Month	Calculated
Total Phosphorus as P	mg/L	1/Month	Grab
Chloride	mg/L	1/Month	Grab
Sulfate	mg/L	1/Month	Grab

1) If no discharge occurs during the reporting period "No Discharge" shall be reported on the DMR.
2) See definitions, Part I.A of the permit.
3) Flow monitoring will be required for the first year of the permit. One year after the effective date of the permit continuous flow monitoring will be required.
4) pH samples will be collected before, during and after sampling event and a maximum, minimum and average value will be reported.
5) The permittee must report daily, maximum daily and 30 day average total volume

Outfall 004A

Effluent monitoring requirements for Outfall 004A are contained in Table 7. Monitoring of the following effluent parameters is required at the end of pipe for outfall 004A. Due to the frequency (2-3 times per year) of the discharge at outfall 004A (DEQ individual activity report May 8, 2007) effluent quality monitoring shall be scheduled to occur once per month. Sampling at outfall 004A shall be based on when a discharge event takes place, therefore sampling shall take place any time a discharge from outfall 004A occurs. Sample type shall be composite in nature, to characterize the quality of effluent

discharged over the length of the discharge event Composite samples will be flow paced, not time paced.

Table 7: Outfall 004A Effluent Self-Monitoring Requirements

Parameter	Units	Frequency	Sample Type[2]
Effluent Flow Duration [1]	hours	Continuous[3]	Continuous
Effluent Flow Volume, Total [1][5]	gallons	Continuous[3]	Continuous
pH	s.u	3/Event[4]	Instantaneous
Specific Conductance	μmhos/cm	3/Event	Instantaneous
Total Dissolved Solids	mg/L	1/Event	Composite
Biological Oxygen Demand	mg/L	1/Event	Composite
Total Nitrogen as N	mg/L	1/Event	Calculated
Total Phosphorus as P	mg/L	1/Event	Composite
Chloride	mg/L	1/Event	Composite
Sulfate	mg/L	1/Event	Composite

1) If no discharge occurs during the reporting period "No Discharge" shall be reported on the DMR.
2) See definitions, Part I.A of the permit
3) Instantaneous flow monitoring will be required to monitor flow during each event.
4) pH samples will be collected before, during and after sampling event and a maximum, minimum and average value will be reported
5) The permittee must report daily, maximum daily and 30 day average total volume

Outfall 005A

Effluent monitoring requirements for Outfall 005A are contained in Table 8. Monitoring of the following effluent parameters is required in the plywood ditch for outfall 005A. Samples collected from outfall 005A will be composite in nature. Samples will be collected from multiple locations in the plywood ditch and composited prior to filling sample bottles.

Table 8: Outfall 005A Effluent Self-Monitoring Requirements

Parameter, units	Units	Frequency	Sample Type[2]
Effluent Flow Duration [1]	day	Continuous[3]	Continuous
Effluent Flow Volume, Total [1][5]	gallons	Continuous[3]	Continuous
pH	s.u	1/week[4]	Instantaneous
Specific Conductance	μmhos/cm	1/week	Instantaneous
Total Dissolved Solids	mg/L	1/Month	Composite
Biological Oxygen Demand	mg/L	1/Month	Composite
Total Nitrogen	mg/L	1/Month	Calculated
Total Phosphorus as P	mg/L	1/Month	Composite
Nitrate plus Nitrite	mg/L	1/Month	Composite
Sulfate	mg/L	1/Month	Composite
Iron, Dissolved	mg/L	1/Month	Composite

Aluminum, Dissolved	mg/L	1/Month	Composite
Zinc, Dissolved	mg/L	1/Month	Composite
Arsenic, Dissolved	mg/L	1/Month	Composite
Cadmium, Dissolved	mg/L	1/Month	Composite
Barium, Dissolved	mg/L	1/Month	Composite
Total Phenol	mg/L	1/Month	Grab

1) If no discharge occurs during the reporting period "No Discharge" shall be reported on the DMR.
2) See definitions, Part I.A of the permit
3) Instantaneous flow monitoring will be required for the first year of the permit. One year after the effective date of the permit continuous flow monitoring will be required.
4) pH samples will be collected before, during and after sampling event. A maximum, minimum and average value will be reported
5) The permittee must report daily, maximum daily and 30 day average total volume

Outfall 006A

Effluent monitoring requirements for Outfall 006A are contained in Table 9. Monitoring of the following effluent parameters is required at the end of pipe of outfall 006A. Samples shall be grab samples collected from the end of pipe originating from the floor drain in the boiler area. As this area is washed down daily, samples shall be collected when this area is actively discharging to ensure effluent samples are collected and are representative of the discharge.

Table 9: Outfall 006A Effluent Self-Monitoring Requirements

Parameter	Units	Frequency	Sample Type(2)
Effluent Flow Duration (1)	day	Continuous(3)	Continuous
Effluent Flow Volume, Total (1)(5)	gallons	Continuous(3)	Continuous
pH	s.u.	1/week(4)	Instantaneous
Specific Conductance	μmhos/cm	1/week	Instantaneous
Total Dissolved Solids	mg/L	1/Month	Grab
Biological Oxygen Demand	mg/L	1/Month	Grab
Total Nitrogen as N	mg/L	1/Month	Calculated
Total Phosphorus as P	mg/L	1/Month	Grab
Chloride	mg/L	1/Month	Grab
Sulfate	mg/L	1/Month	Grab
Iron, Dissolved	mg/L	1/Month	Grab
Aluminum, Dissolved	mg/L	1/Month	Grab
Zinc, Dissolved	mg/L	1/Month	Grab
Barium, Dissolved	mg/L	1/Month	Grab
Arsenic, Dissolved	mg/L	1/Month	Grab
Cadmium, Dissolved	mg/L	1/Month	Grab
Manganese, Dissolved	mg/L	1/Month	Grab
Oil and Grease	mg/L	1/Month	Grab

Toluene	mg/L	1/Month	Grab

1) If no discharge occurs during the reporting period "No Discharge" shall be reported on the DMR.
2) See definitions, Part I.A of the permit
3) Instantaneous flow monitoring will be required for the first year of the permit. One year after the effective date of the permit continuous flow monitoring will be required.
4) pH samples will be collected before, during and after sampling event. A maximum, minimum and average value will be reported
5) The permittee must report daily, maximum daily and 30 day average total volume

The permittee will be responsible for monitoring the quality and quantity of the effluent discharged from all outfalls. Samples or measurements shall be representative of the volume and nature of the monitored discharge. Effluent quality monitoring will be conducted at a sampling point and at a time that allows for accurate characterization of effluent quality and volume.

Water quality monitoring of the effluent shall occur from the last point of control prior to discharge. This includes discharges from the log pond, boiler area and the wastewater overflow area and plywood plant. As the boiler ditch, plywood ditch and wastewater overflow areas receive wastewater periodically, sampling for each monthly monitoring interval shall be conducted when wastewater is discharged during the monthly monitoring period. If no discharge occurs during the monthly monitoring period "No Discharge" shall be indicated on DMR's. The permittee shall monitor the flow of the effluent in accordance with those guidelines in Section VIII. B of this document. Sample collection, preservation, holding times and test procedures for the analysis of pollutants must conform to current regulations as published in 40 CFR 136 and 1007 or other methods approved by the Department.

Effluent flow monitoring will be required such that this data may be used in the future to develop mass based or load limits, a water balance for the facility, ensure proper treatment of wastewater and operation of water management systems. The permittee shall monitor the flow of the effluent continuously, at all outfalls for the duration of the permit cycle. Effluent flow shall be monitored immediately prior to discharge, at those locations indicated in Figure 1. The flow measurement method shall be either by recorder or a totalizing flow meter. Dose counts or pump run-times will not be accepted.

B.) Supplemental Effluent Monitoring

Pursuant to ARM 17.30.1031(5)(b) and (c) the Department can impose self monitoring requirements for each authorized discharge. This includes the pollutants to be monitored and the frequency of monitoring, recording and reporting. The Department is requiring supplemental monitoring for the following reasons:

- Previous effluent quality monitoring has indicated elevated levels of numerous pollutants of concern (Section III part C, Section II part D and E) and;

- Verification that process wastewater is not being discharged to state water is necessary to meet permit conditions.
- Lack of historical effluent monitoring and analysis conducted by PCM

The Department is requiring supplemental monitoring for Outfalls 003A, 004A, 005A and 006A. All water quality sampling will be conducted in accordance with EPA approved methods 40 CFR part136. If No EPA methodology exists, the Permittee shall use a method previously approved by the Department.

The permittee shall monitor Outfalls 003A, 004A, 005A and 006A for those parameters and that those frequencies listed in Table 10. Supplemental monitoring shall be conducted as previously described for each outfall. Supplemental monitoring shall occur at the same time and location that required effluent monitoring is conducted.

Table 10. Outfall 003A, 004A, 005A and 006A

Parameter	Units	Frequency	Sample Type
Aluminum, Dissolved	mg/L	Quarterly	Grab
Barium, Dissolved	mg/L	Quarterly	Grab
Iron, Dissolved	mg/L	Quarterly	Grab
Manganese, Dissolved	mg/L	Quarterly	Grab
Zinc, Dissolved	mg/L	Quarterly	Grab
Arsenic, Dissolved	mg/L	Quarterly	Grab
Total Ammonia as N	mg/L	Quarterly	Grab
Total Phenols	mg/L	Quarterly	Grab
VOC	mg/L	Quarterly	Grab
Major Ions	mg/L	Quarterly	Grab
TPH-IR	mg/L	Quarterly	Grab
Tannin and Lignin	mg/L	Quarterly	Grab
Oil and Grease	mg/L	Quarterly	Grab
Formaldehyde	mg/L	Quarterly	Grab

1) Major Ions are Na^+, K^+, Ca^{2+}, Mg^{2+}, F^-, Cl^-, SO_4^{2-}, HCO_3^-, PO_4^{3-}

C.) Ground Water Monitoring

Pursuant to 17.30.1023(5)(a), the Department can require the submission of additional data and information with any MGWPC permit application where warranted by potential impacts of a source including but not limited to geologic conditions, ground water characteristics, and local hydrogeology. As the permittee has submitted limited information and data with regards to characterization of the local hydrogeological conditions, the Department is requiring this information to be provided as a permit condition. Pursuant to 17.30.1031, all issued MGWPCS permits must contain special conditions which will assure compliance with the ground water quality standards. These special conditions include, but are not limited to, the self monitoring requirements for each discharge, monitoring well configuration and pollutants to be monitored, frequency

of monitoring, recording and reporting and analytical methods to be utilized by the permittee.

Monitoring of newly installed wells (See Section VIII, A of this document) shall commence within 180 days of the effective date of this permit and continue on a monthly or quarterly basis, for the duration of the permit cycle. Newly installed wells shall be monitored for those parameters and at the frequency listed in table 11. The results of this analysis will be submitted to the Department monthly in the form of facility DMRs utilized with the next permit renewal to determine the extent of potentially impacted groundwater.

If any monitoring well(s) are abandoned, destroyed or decommissioned during any activities at the facility or are no longer able to be sampled due to fluctuations in the ground water table, PCM shall install a new well to replace the abandoned, destroyed, decommissioned or the non-viable well(s). PCM may use existing monitoring wells provided that ground water quality data collected from them are representative of the aquifer conditions and ground water quality.

Table 11: Ground Water Self-Monitoring Requirements

Parameter	Units	Frequency	Sample Type
Static Water Level	Ft.	Monthly	Instantaneous
pH	s.u	Monthly	Instantaneous
Specific Conductance	μmhos/cm	Monthly	Instantaneous
Nitrate + Nitrite	mg/L	Quarterly	Grab
Total Nitrogen as N	mg/L	Quarterly	Calculated
Total Phosphorus as P	mg/L	Quarterly	Grab
Total Ammonia as N	mg/L	Quarterly	Grab
TKN	mg/L	Quarterly	Grab
Sulfate	mg/L	Quarterly	Grab
BOD	mg/L	Quarterly	Grab
COD	mg/L	Quarterly	Grab
Aluminum, Total Dissolved	mg/L	Quarterly	Grab
Barium, Total Dissolved	mg/L	Quarterly	Grab
Iron, Total Dissolved	mg/L	Quarterly	Grab
Manganese, Total Dissolved	mg/L	Quarterly	Grab
Zinc, Total Dissolved	mg/L	Quarterly	Grab
Arsenic, Total Dissolved	mg/L	Quarterly	Grab
Copper, Total Dissolved	mg/L	Quarterly	Grab
TPH-IR	mg/L	Quarterly	Grab
Tannin and Lignin	mg/L	Quarterly	Grab
Total Phenols	mg/L	Quarterly	Grab
Major Ions	mg/L	Quarterly	Grab
Formaldehyde	mg/L	Quarterly	Grab

1) Major Ions are Na^{+}, K^{+}, Ca^{2+}, Mg^{2+}, F^{-}, Cl^{-}, SO_4^{2-}, HCO_3^{-}, PO_4^{3-}

In conjunction with routine sampling of newly installed monitoring wells, PCM will be required to continue sampling the existing monitoring wells on site. This includes but is not limited to, monthly sampling of MW-1, MW-2, MW3a and MW-5. These wells will be sampled for those parameters and at the frequency listed in Table 12. Ground water monitoring of existing wells shall commence on the effective date of the permit and continue on a quarterly basis for the duration of the permit cycle.

Table 12: Ground Water Self-Monitoring Requirements

Parameter	Units	Frequency	Sample Type
Static Water Level	Ft.	Quarterly	Instantaneous
pH	s.u	Quarterly	Instantaneous
Specific Conductance	μmhos/cm	Quarterly	Instantaneous
TDS	mg/L	Quarterly	Grab
Chloride	mg/L	Quarterly	Grab
TKN	mg/L	Quarterly	Grab
Total Ammonia as N	mg/L	Quarterly	Grab
Nitrate plus Nitrite as N	mg/L	Quarterly	Grab

VII. Nonsignificance Determination

As discussed in Section III C of this document, the proposed discharges from PCM do not constitute new or increased sources of pollutants pursuant to ARM 17.30.702(16). Therefore, a nonsignificance analysis is not required [ARM 17.30.705(1)].

VIII. Special Conditions/Compliance Schedules

A) Ground Water Study

Within 180 days of the effective date of the permit, the permittee shall submit to the Department, for review and comment a ground water quality and quantity assessments as well as a ground water quality monitoring plan. The plan shall include but is not limited to an assessment of the hydrogeologic conditions in the immediate area, ground water monitoring well installation, monitoring, sampling and analysis. The plan shall include but not be limited to the following:

1. Physical and chemical characterization of the aquifer beneath the PCM site.

a. The permittee shall provide a physical hydrogeologic characterization of the aquifer beneath the PCM Lumber Mill. The permittee shall provide the lithology, hydraulic conductivity (K), Transmissivity (T), Storitivity (S), gradient (i) and the thickness and extent of the shallowest aquifer.
b. The permittee shall determine the depth to ground water, groundwater flow direction and gradient, identify groundwater divides, hydraulic connectivity with surface water and document seasonal fluctuations in ground water flow regime.
c. The permittee shall be responsible for delineation of the spatial and temporal variability in ground water quantity and quality including determination of the fate and transport of pollutants in the groundwater beneath the entire PCM Columbia Falls facility.

2. Ground Water Monitoring Well Installation

a. Information pertaining to the location, design and development of monitoring wells upgradient and downgradient of the PCM Lumber Mill. All monitoring wells shall be located on land owned, or controlled by the permittee. The permittee shall demonstrate access to the proposed monitoring well locations for the life of the facility.
b. Conceptual drawings of the proposed wells, and a description of the well development process.
c. Upgradient wells installed in the same hydrogeologic unit, outside of influence of the permitted outfalls at the PCM Lumber Mill site.
d. If upgradient wells cannot be completed in the same hydrogeologic unit the permittee shall identify a suitable alternative upgradient wells or reference wells.
e. The permittee shall be responsible for sampling monitoring wells on a monthly basis and reporting those results to the Department on a quarterly basis. Reports shall include water quality analytical results, potentiometric maps and ground water flow directions for each sampling event and ground water depths.
f. The permitee will submit to the Department well logs for all wells used in the above mentioned analysis.

3. Ground Water Monitoring Well Locations

a. One well will be installed on the down gradient edge of the standard mixing zone issued to the log pond (outfall 003A). This well will serve as a monitoring point, to ensure that no detriment occurs to beneficial uses. This well will be called compliance point (003A-MW)
b. A second monitoring well will be installed on the down gradient edge of the standard mixing zone for the wastewater overflow area (outfall 004A). This well will serve as a monitoring point, to ensure that no detriment

occurs to beneficial uses. This well will be called compliance point (004A-MW)

c. A third monitoring well will be installed down gradient of the plywood pond. This well will serve as a monitoring point, to ensure that no detriment occurs to beneficial uses. This well will be called compliance point (005A-MW)
d. A fourth monitoring well will be installed down gradient of the boiler ditch. This well will serve as a monitoring point, to ensure that no detriment occurs to beneficial uses This well will be called compliance point (006A-MW)
b. A fifth monitoring well will be installed upgradient of the entire facility. This well will be centrally located upgradient of the northeast corner of the PCM class III landfill and north of 3rd St. West North on PCM property. MW-2 will no longer be considered up gradient. Due to its close proximity to West Pond A, there is potential for this well to have been effected by groundwater mounding from previous discharges and seepage from West Pond A. MW-2 is currently downgradient of the PCM Class III landfill, which may allow this well to be impacted by runoff and seepage from the landfill and thereby not provide an accurate assessment of ambient ground water quality.

4. Monitoring Well Sampling.

a. The permittee shall sample all monitoring wells at the frequency and for the parameters listed in table 10. Sampling shall include but not be limited to those parameters listed in table 10.
b. The permittee shall analyze all samples in accordance with EPA accepted 40 CFR 136 methods. If no EPA approved methodology exists for a parameter the permittee shall analyze those samples via a Department approved method.
c. The permittee shall sample the wells in accordance with the Departments Historical Non-point Source Water Quality Standard Operating Procedures subpart 11.10 Groundwater Data Collection.

All wells will be finished in the shallowest water bearing aquifer. If groundwater monitoring wells are not finished in the shallowest water bearing aquifer PCM will be required to install a new monitoring well that is finished in the shallowest water bearing aquifer. Aquifer tests shall be performed on all the newly constructed wells to acquire values for Hydraulic Conductivity, Transmissivity and Storitivity of the aquifer. Ground water flow gradient shall be ascertained and a ground water flow direction established. The Department must approve all well locations prior to installation. Proposed well locations will be submitted to the Department for review and comment within 180 days from the effective date of the permit, and at least 30 days prior to installation. Well logs for the newly constructed wells will be submitted to the Department upon completion. All wells

are to be designed, located and constructed in a manor that allows sampling to be conducted year round.

The ground water monitoring plan including proposed well locations shall be submitted to the Department for review and comment within 180 days of the effective date of the permit. Well locations shall be approved by the Department prior to installation. Well logs for the newly constructed wells will be submitted to the Department upon completion. If the Department comments on the Plan and requires substantive modifications, a revised plan shall to be submitted to the Department within 60 days of permittee receipt of Department comments. Wells must be installed within 30 days of consent by the Department.

B) Effluent Flow Measurement

Presently PCM dose not currently have the capacity to monitor the volume or rate of discharge for any of the permitted outfalls. PCM will be required to monitor effluent flow following treatment and immediately prior to discharge from outfalls 003A, 004A, 005A and 006A. Due to the nature of the discharges to outfalls 003A and 005A effluent flow monitoring must be capable of measuring all contributions of flow to these outfalls. This includes but is not limited to process wastewater, storm water, blow down, any runoff form log deck operations and facility wash down water. The permittee shall install effluent flow monitoring equipment with the capability of quantifying all flow contributions to an outfall. Prior to installation of effluent flow monitoring equipment PCM shall submit proposed methodologies to the Department for review and approval. Flow measuring equipment shall be installed within one (1) year of the effective date of the permit. The permittee shall monitor the flow of the effluent continuously. In the interim flow monitoring will be conducted on an instantaneous basis when effluent water quality samples are collected.

C) Monitoring Well Installation

Within 180 days of the effective date of the permit, the permittee shall submit to the Department for comment, a plan for ground water monitoring well installation to include a brief summary of the monitoring, sampling and analysis plan for monitoring wells 003A-MW, 004A-MW, 005A-MW, 006A-MW and the up gradient well. The plan is to include the location, conceptual design and construction methods for the planned ground water monitoring wells, and the monitoring, sampling and analysis methods that will be used to meet the monitoring required in the Permit.

Within 60 days of the installation of monitoring wells, the permittee shall submit to the Department a brief report or letter documenting the results of the monitoring well installation including the final location of the installed monitoring wells, construction details for each well and a report on ground water quality in the from the well. Ground water quality analysis shall include those parameters listed in Tables 11 and 12. Ground water quality monitoring shall begin immediately after well development and appropriate recovery and rest period, and continue though the duration of the permit.

D) Storm Water Pollution Prevention Plan

As a result of storm water management practices as documented in the June 24, 2003 and May 31, 2007 inspection reports (discussed in Section II. E), the Department has determined a need for an onsite Storm Water Pollution Prevention Plan (SWPPP). The Department has concluded that prudent and reasonable land, soil and water conservation practices to protect state waters will be achieved through development, implementation and enforcement of SWPPP. The purpose of the SWPPP is to identify sources of pollution to storm water and to select Best Management Practices (BMPs) to eliminate or minimize pollutant discharges at the source and/or to remove pollutants contained in storm water runoff. The facility will be expected to adhere to requirements for storm water discharges associated with industrial activities.

Those activities of concern, which are to be included in a Storm Water Pollution Prevention Plan (SWPPP) include but are not limited to storm water runoff and commingled storm water runoff associated with: The plywood production facility and the area surrounding it; the sawmill and planer facilities and the area surrounding them, log storage area north of the plywood production facility; the boiler facility and the area surrounding it, the MDF plant and the area surrounding it, the log pond and the log yard and the areas surrounding them. The permittee must implement the provisions of the SWPPP required under those conditions outlined in the permit with 180 days of the effective date of the permit.

E) Containment of Ash Bunker Runoff

The Department has determined (Section IV. C) that runoff produced during the saturation of hog fuel ash and veneer dryer ash (from the boiler facility and plywood facility respectively) is considered process wastewater and has the potential to detrimentally affect ground water in the areas of discharge. Therefore, runoff must be retained. No discharge of process wastewater is authorized by this permit. PCM must cease discharging ash bunker runoff within two (2) years of the effective date of the permit.

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Completed by Louis Volpe August 22, 2007

Appendix A

Table A-1: Effluent Characteristics (1) for outfall 003A from Jan 1, 2003 to Dec 31, 2006

Parameter	Location	Units	Previous Permit Limit	Minimum Value	Maximum Value	Average Value	Number of Samples
Flow, Daily Average	Effluent	gpd	(3)	(2)	(2)	(2)	(2)
Biochemical Oxygen Demand (BOD_5)	Influent	mg/L	(3)	(2)	(2)	(2)	(2)
	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)
	Effluent	% removal	(3)	(2)	(2)	(2)	(2)
	Effluent	lbs/day	(3)	(2)	(2)	(2)	(2)
Total Dissolved Solids (TDS)	Influent	mg/L	(3)	(2)	(2)	(2)	(2)
	Effluent	mg/L	(3)	763	3920	2459.4	18
	Effluent	% removal	(3)	(2)	(2)	(2)	(2)
	Effluent	lbs/day	(3)	(2)	(2)	(2)	(2)
Escherichia coli (E. coli)	Effluent	No./100ml	(3)	(2)	(2)	(2)	(2)
pH	Effluent	s.u.	(3)	6.8	8.3	7.5	18
Specific Conductance	Effluent	µS/cm	(3)	1200	5270	3496	18
Chloride	Effluent	mg/L	(3)	262	1600	882.25	18
Total Ammonia, as N,	Effluent	mg/L	(3)	0.1	92.4	24.9	18
Total Kjeldahl Nitrogen	Effluent	mg/L	(3)	2.5	177	64.9	18
Nitrate + Nitrite, as N	Effluent	mg/L	(3)	0.09	0.33	0.17	3
Total Nitrogen	Influent	mg/L	(3)	(2)	(2)	(2)	(2)
		lbs/day	(3)	(2)	(2)	(2)	(2)
Total Nitrogen	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)
		lbs/day	(3)	(2)	(2)	(2)	(2)
Nitrogen	Effluent	% removal	(3)	(2)	(2)	(2)	(2)
Total Phosphorus	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)
		lbs/day	(3)	(2)	(2)	(2)	(2)
Oil and Grease	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)

Footnotes:

(1) Conventional and nonconventional pollutants only, table does not include toxics.
(2) Data not available: no samples collected for this parameter.
(3) No limit in previous permit.

Table A-2: Effluent Characteristics (1) for outfall 004A from Jan 1, 2003 to June 30, 2006

Parameter	Location	Units	Previous Permit Limit	Minimum Value	Maximum Value	Average Value	Number of Samples
Flow, Daily Average	Effluent	gpd	(3)	(2)	(2)	(2)	(2)
Biochemical Oxygen Demand (BOD_5)	Influent	mg/L	(3)	(2)	(2)	(2)	(2)
	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)
	Effluent	% removal	(3)	(2)	(2)	(2)	(2)
	Effluent	lbs/day	(3)	(2)	(2)	(2)	(2)
Total Dissolved Solids (TDS)	Influent	mg/L	(3)	(2)	(2)	(2)	(2)
	Effluent	mg/L	(3)	1530	3050	2344	5
	Effluent	% removal	(3)	(2)	(2)	(2)	(2)
	Effluent	lbs/day	(3)	(2)	(2)	(2)	(2)
Escherichia coli (E. coli)	Effluent	No./100ml	(3)	(2)	(2)	(2)	(2)
pH	Effluent	s.u.	(3)	7.1	8.1	7.62	5
Specific Conductance	Effluent	µS/cm	(3)	2180	4850	3452	5
Chloride	Effluent	mg/L	(3)	477	1000	729.4	5
Total Ammonia	Effluent	mg/L	(3)	0.1	142	54.94	5
Total Kjeldahl Nitrogen	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)
Nitrate + Nitrite, as N	Effluent	mg/L	(3)	0	0	0	(2)
Total Nitrogen	Influent	mg/L	(3)	(2)	(2)	(2)	(2)
		lbs/day	(3)	(2)	(2)	(2)	(2)
Total Nitrogen	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)
		lbs/day	(3)	(2)	(2)	(2)	(2)
Nitrogen	Effluent	% removal	(3)	(2)	(2)	(2)	(2)
Total Phosphorus	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)
		lbs/day	(3)	(2)	(2)	(2)	(2)
Oil and Grease	Effluent	mg/L	(3)	(2)	(2)	(2)	(2)

Footnotes:
(1) Conventional and nonconventional pollutants only, table does not include toxics.
(2) Data not available: no samples collected for this parameter.
(3) No limit in previous permit.

Table. A-3 Outfall 005A (Plywood Ditch)

Pollutant or Parameter	Maximum		Average		No. of Samples	Analytical Method	ML	Source of Estimate
	Concentration	Units	Concentration	Units				
Conventional Pollutants								
pH (Minimum)	9.68	s.u	9.68	s.u	1			
pH (Maximum)	5.6	s.u	5.6	s.u	1			
Total Suspended Solids (TSS)	1140	mg/L	746	mg/L	2			
Biochemical Oxygen Demand (BOD_5)	1300	mg/L	784	mg/L	2			
Oil & Grease	45.5	mg/L	45.5	mg/L	1			
Chlorine, Total Residual (TRC)	0.25	mg/L	0.25	mg/L	1			
Escherichia Coli Bateria					0			
Dissolved Oxygen	<1.0	mg/L	<1.0	mg/L	1			
Ammonia, as N	0.31	mg/L	0.31	mg/L	1			
Kjeldahl Nitrogen, Total	24.2	mg/L	24.2	mg/L	1			
Nitrate + Nitrite, as N	63.4	mg/L	31.7	mg/L	2			
Phosphorus, Total	8.13	mg/L	6.49	mg/L	2			
Total Dissolved Solids	2940	mg/L	2940	mg/L	1			
Specific Conductivity	3280	µmhos /cm	3280	µmhos/cm	1			
Chloride	75.6	mg/L	75.6	mg/L	1			
Sulfate	447	mg/L	431	mg/L	2			
Alkalinity, as $CaCO_3$	1020	mg/L	1020	mg/L	1			
Iron, Total Recoverable	1.36	mg/L	1.18	mg/L	2			
Manganese, Total Recoverable	1.50	mg/L	1.50	mg/L	1			
Aluminum, Total	1.6	mg/L	1.6	mg/L	1			
Barium, Total	1.2	mg/L	1.2	mg/L	1			
Boron, Total	0.8	mg/L	0.8	mg/L	1			
Magnesium, Total	17.9	mg/L	16.45	mg/L	2			
Manganese, Total	1.21	mg/L	1.21	mg/L	1			
Metals (Total Recoverable), Cyanide, Phenols and Hardness								
Antimony	<0.05	mg/L	<0.05	mg/L	2			
Arsenic	0.085	mg/L	0.045	mg/L	2			
Beryllium	<0.001	mg/L	<.001	mg/L	2			
Cadmium	0.007	mg/L	0.004	mg/L	2			
Chromium	0.027	mg/L	0.023	mg/L	2			
Copper	0.129	mg/L	0.089	mg/L	2			
Lead	0.02	mg/L	0.014	mg/L	2			
Mercury	<0.002	mg/L	<0.002	mg/L	2			
Nickel	0.04	mg/L	0.024	mg/L	2			
Selenium	0.011	mg/L	0.008	mg/L	2			
Silver	<0.005	mg/L	<0.005	mg/L	2			
Thallium	<0.1	mg/L	<0.1	mg/L	2			
Zinc	1.42	mg/L	0.935	mg/L	2			
Cyanide	<0.008	mg/L	<0.008	mg/L	2			
Total Phenolic Compounds	5.4	mg/L	3.18	mg/L	2			
Hardness (as $CaCO_3$)	212	mg/L	212	mg/L	1			

Pollutant or Parameter	Maximum		Average		No. of Samples	Analytical Method	ML	Source of Estimate
	Concentration	units	Concentration	units				
Volatile Organic Compounds								
Acrolein	ND	mg/L		mg/L	1			
Acrylonitrile	ND	mg/L		mg/L	1			
Benzene	ND	mg/L		mg/L	1			
Bromoform	ND	mg/L		mg/L	1			
Carbon Tetrachloride	ND	mg/L		mg/L	1			
Clorobenzene	ND	mg/L		mg/L	1			
Chlorodibromo-Methane	ND	mg/L		mg/L	1			
Chloroethane	ND	mg/L		mg/L	1			
2-Chloro-Ethylvinyl Ether	ND	mg/L		mg/L	1			
Chloroform	ND	mg/L		mg/L	1			
Dichlorobromo-Methane	ND	mg/L		mg/L	1			
1,1-Dichloroethane	ND	mg/L		mg/L	1			
1,2-Dichloroethane	ND	mg/L		mg/L	1			
Trans-1,2-Dichloro-Ethylene	ND	mg/L		mg/L	1			
1,1-Dichloroethylene	ND	mg/L		mg/L	1			
1,2-Dichloropropane	ND	mg/L		mg/L	1			
1,3-Dichloro-Propylene	ND	mg/L		mg/L	1			
Ethylbenzene	ND	mg/L		mg/L	1			
Methyl Bromide	ND	mg/L		mg/L	1			
Methyl Chloride	ND	mg/L		mg/L	1			
Methylene Chloride	ND	mg/L		mg/L	1			
1,1,2,2-Tetrachloro-Ethane	ND	mg/L		mg/L	1			
Tetrachloro-Ethylene	ND	mg/L		mg/L	1			
Toluene	ND	mg/L		mg/L	1			
1,1,1-Trichloroethane	ND	mg/L		mg/L	1			
1,1,2-Trichloroethane	ND	mg/L		mg/L	1			
Trichlorethylene	ND	mg/L		mg/L	1			
Vinyl Chloride	ND	mg/L		mg/L	1			
Acid-Extractable Compounds								
P-Chloro-M-Cresol	ND	mg/L		mg/L	1			
2-Chlorophenol	ND	mg/L		mg/L	1			
2,4,-Dichlorophenol	ND	mg/L		mg/L	1			
2,4-Dimethylphenol	ND	mg/L		mg/L	1			
4,6-Dinitro-O-Cresol	ND	mg/L		mg/L	1			
2,4-Dinitrophenol	ND	mg/L		mg/L	1			
2-Nitrophenol	ND	mg/L		mg/L	1			
4-Nitrophenol	ND	mg/L		mg/L	1			
Pentachlorophenol	ND	mg/L		mg/L	1			
Phenol	ND	mg/L		mg/L	1			
2,4,6-Trichlorophenol	ND	mg/L		mg/L	1			

Pollutant or Parameter	Maximum		Average		No. of Samples	Analytical Method	ML	Source of Estimate
	Concentration	units	Concentration	units				
Base-Neutral Compounds								
Acenaphthene	ND	mg/L		mg/L	1			
Acenaphthylene	ND	mg/L		mg/L	1			
Anthracene	ND	mg/L		mg/L	1			
Benzidine	ND	mg/L		mg/L	1			
Benzo(a)Anthracene	ND	mg/L		mg/L	1			
Benzo(a)Pyrene	ND	mg/L		mg/L	1			
3,4 Benzo-Fluoranthene	ND	mg/L		mg/L	1			
Benzo(ghi)Perylene	ND	mg/L		mg/L	1			
Benzo(k)Fluoranthene	ND	mg/L		mg/L	1			
Bis (2-Chloroethoxy) Methane	ND	mg/L		mg/L	1			
Bis (2-Chloroethyl)-Ether	ND	mg/L		mg/L	1			
Bis (2-Chloroiso-Propyl) Ether	ND	mg/L		mg/L	1			
Bis (2-Ethylhexyl) Phthalate	ND	mg/L		mg/L	1			
4-Bromophenyl Phenyl Ether	ND	mg/L		mg/L	1			
Butyl Benzyl Phthalate	ND	mg/L		mg/L	1			
2-Chloronaphthalene	ND	mg/L		mg/L	1			
4-Chlorphenyl Phenyl Ether	ND	mg/L		mg/L	1			
Chrysene	ND	mg/L		mg/L	1			
Di-N-Butyl Phthalate	ND	mg/L		mg/L	1			
Di-N-Octyl Phthalate	ND	mg/L		mg/L	1			
Dibenzo(A,H) Anthracene	ND	mg/L		mg/L	1			
1,2-Dichlorobenzene	ND	mg/L		mg/L	1			
1,3-Dichlorobenzene	ND	mg/L		mg/L	1			
1,4-Dichlorobenzene	ND	mg/L		mg/L	1			
3,3-Dichlorobenzidine	ND	mg/L		mg/L	1			
Diethyl Phthalate	ND	mg/L		mg/L	1			
Dimethyl Phthalate	ND	mg/L		mg/L	1			
2,4-Dinitrotoluene	ND	mg/L		mg/L	1			
2,6-Dinitrotoluene	ND	mg/L		mg/L	1			
1,2-Diphenylhydrazine	ND	mg/L		mg/L	1			
Fluoranthene	ND	mg/L		mg/L	1			
Fluorene	ND	mg/L		mg/L	1			
Hexachlorobenzene	ND	mg/L		mg/L	1			
Hexachlorobutadiene	ND	mg/L		mg/L	1			
Hexachlorocyclo-Pentadiene	ND	mg/L		mg/L	1			
Hexachloroethane	ND	mg/L		mg/L	1			
Indeno(1,2,3-CD)Pyrene	ND	mg/L		mg/L	1			
Isophorone	ND	mg/L		mg/L	1			
Naphthalene	ND	mg/L		mg/L	1			
Nitrobenzene	ND	mg/L		mg/L	1			
N-Nitrosodi-N-Propylamine	ND	mg/L		mg/L	1			
N-Nitrosodi-Methylamine	ND	mg/L		mg/L	1			
N-Nitrosodi-Phenylamine	ND	mg/L		mg/L	1			

Phenanthrene	ND	mg/L		mg/L	1			
Pyrene	ND	mg/L		mg/L	1			
1,2,4-Trichlorobenzene	ND	mg/L		mg/L	1			

ND = Parameter not detected
NS = No sample taken

Table. A-4 Outfall 006A (Boiler Ditch)

Pollutant or Parameter	Maximum		Average		No. of Samples	Analytical Method	ML	Source of Estimate
	Concentration	Units	Concentration	Units				
Conventional Pollutants								
s.u pH (Minimum)	6.3	s.u	6.3	s.u	1			
pH (Maximum)	8.2	mg/L	8.2	s.u	1			
Total Suspended Solids (TSS)	113	mg/L	73	mg/L	2			
Biochemical Oxygen Demand (BOD_5)	60	mg/L	46.5	mg/L	2			
Oil & Grease	6.4	mg/L	6.4	mg/L	1			
Chlorine, Total Residual (TRC)	<0.05	mg/L	<0.05	mg/L	1			
Escherichia Coli Bacteria		mg/L		mg/L	0			
Dissolved Oxygen	5.93	mg/L	5.93	mg/L	1			
Ammonia, as N	11.8	mg/L	5.54	mg/L	2			
Kjeldahl Nitrogen, Total	9.70	mg/L	9.70	mg/L	1			
Nitrate + Nitrite, as N	2.12	mg/L	1.06	mg/L	2			
Phosphorus, Total	7.38	mg/L	5.0	mg/L	2			
Total Dissolved Solids	797	mg/L	797	mg/L	1			
Specific Conductivity	1310	µmhos/cm	1310	µmhos/cm	1			
Chloride	19	mg/L	19	mg/L	1			
Sulfate	116	mg/L	64.3	mg/L	2			
Alkalinity, as $CaCO_3$	772	mg/L	772	mg/L	1			
Iron, Total Recoverable	9.97	mg/L	6.01	mg/L	2			
Manganese, Total Recoverable	3.47	mg/L	2.24	mg/L	2			
Aluminum, Total	1.6	mg/L	1.6	mg/L	1			
Barium, Total	0.5	mg/L	0.5	mg/L	1			
Boron, Total	0.1	mg/L	0.1	mg/L	1			
Magnesium, Total	61.4	mg/L	39.2	mg/L	2			
Manganese, Total	1.01	mg/L	0.01	mg/L	1			
Metals (Total Recoverable), Cyanide, Phenols and Hardness								
Antimony	<0.3	mg/L	<0.3	mg/L	2			
Arsenic	0.035	mg/L	0.021	mg/L	2			
Beryllium	<0.001	mg/L	<0.001	mg/L	2			
Cadmium	0.0077	mg/L	0.001	mg/L	2			
Chromium	0.02	mg/L	0.018	mg/L	2			
Copper	0.075	mg/L	0.063	mg/L	2			
Lead	0.2	mg/L	0.11	mg/L	2			
Mercury	<0.002	mg/L	<0.002	mg/L	2			
Nickel	0.04	mg/L	0.027	mg/L	2			
Selenium	<0.005	mg/L	<0.005	mg/L	2			
Silver	<0.005	mg/L	<0.005	mg/L	1			
Thallium	<0.1	mg/L	<0.1	mg/L	1			
Zinc	1.01	mg/L	0.675	mg/L	2			
Cyanide	<0.005	mg/L	<0.005	mg/L	2			
Total Phenolic Compounds	0.15	mg/L	0.1	mg/L	2			
Hardness (as $CaCO_3$)	1030	mg/L	1030	mg/L	1			

Pollutant or Parameter	Maximum		Average		No. of Samples	Analytical Method	ML	Source of Estimate
	Concentration	units	Concentration	Units				
Volatile Organic Compounds								
Acrolein	ND	mg/L		mg/L	1			
Acrylonitrile	ND	mg/L		mg/L	1			
Benzene	ND	mg/L		mg/L	1			
Bromoform	ND	mg/L		mg/L	1			
Carbon Tetrachloride	ND	mg/L		mg/L	1			
Clorobenzene	ND	mg/L		mg/L	1			
Chlorodibromo-Methane	ND	mg/L		mg/L	1			
Chloroethane	ND	mg/L		mg/L	1			
2-Chloro-Ethylvinyl Ether	ND	mg/L		mg/L	1			
Chloroform	ND	mg/L		mg/L	1			
Dichlorobromo-Methane	ND	mg/L		mg/L	1			
1,1-Dichloroethane	ND	mg/L		mg/L	1			
1,2-Dichloroethane	ND	mg/L		mg/L	1			
Trans-1,2-Dichloro-Ethylene	ND	mg/L		mg/L	1			
1,1-Dichloroethylene	ND	mg/L		mg/L	1			
1,2-Dichloropropane	ND	mg/L		mg/L	1			
1,3-Dichloro-Propylene	ND	mg/L		mg/L	1			
Ethylbenzene	ND	mg/L		mg/L	1			
Methyl Bromide	ND	mg/L		mg/L	1			
Methyl Chloride	ND	mg/L		mg/L	1			
Methylene Chloride	ND	mg/L		mg/L	1			
1,1,2,2-Tetrachloro-Ethane	ND	mg/L		mg/L	1			
Tetrachloro-Ethylene	ND	mg/L		mg/L	1			
Toluene	2.70	mg/L		mg/L	1			
1,1,1-Trichloroethane	ND	mg/L		mg/L	1			
1,1,2-Trichloroethane	ND	mg/L		mg/L	1			
Trichlorethylene	ND	mg/L		mg/L	1			
Vinyl Chloride	ND	mg/L		mg/L	1			
Acid-Extractable Compounds								
P-Chloro-M-Cresol	ND	mg/L		mg/L	1			
2-Chlorophenol	ND	mg/L		mg/L	1			
2,4,-Dichlorophenol	ND	mg/L		mg/L	1			
2,4-Dimethylphenol	ND	mg/L		mg/L	1			
4,6-Dinitro-O-Cresol	ND	mg/L		mg/L	1			
2,4-Dinitrophenol	ND	mg/L		mg/L	1			
2-Nitrophenol	ND	mg/L		mg/L	1			
4-Nitrophenol	ND	mg/L		mg/L	1			
Pentachlorophenol	ND	mg/L		mg/L	1			
Phenol	ND	mg/L		mg/L	1			
2,4,6-Trichlorophenol	ND	mg/L		mg/L	1			

Pollutant or Parameter	Maximum		Average		No. of Samples	Analytical Method	ML	Source of Estimate
	Concentration	units	Concentration	units				
Base-Neutral Compounds								
Acenaphthene	ND	mg/L		mg/L	1			
Acenaphthylene	ND	mg/L		mg/L	1			
Anthracene	ND	mg/L		mg/L	1			
Benzidine	ND	mg/L		mg/L	1			
Benzo(a)Anthracene	ND	mg/L		mg/L	1			
Benzo(a)Pyrene	ND	mg/L		mg/L	1			
3,4 Benzo-Fluoranthene	ND	mg/L		mg/L	1			
Benzo(ghi)Perylene	ND	mg/L		mg/L	1			
Benzo(k)Fluoranthene	ND	mg/L		mg/L	1			
Bis (2-Chloroethoxy) Methane	ND	mg/L		mg/L	1			
Bis (2-Chloroethyl)-Ether	ND	mg/L		mg/L	1			
Bis (2-Chloroiso-Propyl) Ether	ND	mg/L		mg/L	1			
Bis (2-Ethylhexyl) Phthalate	ND	mg/L		mg/L	1			
4-Bromophenyl Phenyl Ether	ND	mg/L		mg/L	1			
Butyl Benzyl Phthalate	ND	mg/L		mg/L	1			
2-Chloronaphthalene	ND	mg/L		mg/L	1			
4-Chlorphenyl Phenyl Ether	ND	mg/L		mg/L	1			
Chrysene	ND	mg/L		mg/L	1			
Di-N-Butyl Phthalate	ND	mg/L		mg/L	1			
Di-N-Octyl Phthalate	ND	mg/L		mg/L	1			
Dibenzo(A,H) Anthracene	ND	mg/L		mg/L	1			
1,2-Dichlorobenzene	ND	mg/L		mg/L	1			
1,3-Dichlorobenzene	ND	mg/L		mg/L	1			
1,4-Dichlorobenzene	ND	mg/L		mg/L	1			
3,3-Dichlorobenzidine	ND	mg/L		mg/L	1			
Diethyl Phthalate	ND	mg/L		mg/L	1			
Dimethyl Phthalate	ND	mg/L		mg/L	1			
2,4-Dinitrotoluene	ND	mg/L		mg/L	1			
2,6-Dinitrotoluene	ND	mg/L		mg/L	1			
1,2-Diphenylhydrazine	ND	mg/L		mg/L	1			
Fluoranthene	ND	mg/L		mg/L	1			
Fluorene	ND	mg/L		mg/L	1			
Hexachlorobenzene	ND	mg/L		mg/L	1			
Hexachlorobutadiene	ND	mg/L		mg/L	1			
Hexachlorocyclo-Pentadiene	ND	mg/L		mg/L	1			
Hexachloroethane	ND	mg/L		mg/L	1			
Indeno(1,2,3-CD)Pyrene	ND	mg/L		mg/L	1			
Isophorone	ND	mg/L		mg/L	1			
Naphthalene	ND	mg/L		mg/L	1			
Nitrobenzene	ND	mg/L		mg/L	1			
N-Nitrosodi-N-Propylamine	ND	mg/L		mg/L	1			
N-Nitrosodi-Methylamine	ND	mg/L		mg/L	1			
N-Nitrosodi-Phenylamine	ND	mg/L		mg/L	1			

Phenanthrene	ND	mg/L		mg/L	1			
Pyrene	ND	mg/L		mg/L	1			
1,2,4-Trichlorobenzene	ND	mg/L		mg/L	1			

ND = Parameter not detected
NS = No sample taken

Table A-5 June 24 2003 Inspection Analytical Results

Parameter	Units	MW-4	MDF Pond
VOLATILE ORGANIC COMPOUNDS			
4-Isopropyltoluene	ug/L	1.14	9.59
Acetone	ug/L	105	764
Carbon Disulfide	ug/L	0.49	1.10
2-Chloroethyle Vinyl Ether	ug/L	5.22	<0.50
2-Hexanone	ug/L	<0.50	2.50
Methyl Isobutyl Ketone	ug/L	2.69	9.61
Toluene	ug/L	1.47	<0.50
CARBONAL COMPOUNDS			
Formaldehyde	ug/L	1,086	19,610
Acetaldehyde	ug/L	12.7	19.5
Benzaldehyde	ug/L	<1.0	1.4
Butanal	ug/L	9.85	10.7
Crotonaldehyde	ug/L	1.0	10.1
Cyclohexanone	ug/L	1.22	<1.0
Decanal	ug/L	6.18	29.9
Glyoxal	ug/L	2.32	36.1
Heptanal	ug/L	<2.0	6.77
Hexanal	ug/L	1.07	16.6
Methyl Glyoxal	ug/L	10.1	58.8
Nonanal	ug/L	10.2	22.1
Octanal	ug/L	19.7	16.4
Pentanal	ug/L	<1.0	26.7
Propanal	ug/L	8.21	13.1
SYNTHETIC ORGANIC COMPOUNDS			
di(2-ethylhexyl) phthalate	ug/L	358	15.3
di(2-ethylhexyl) adipate	ug/L	0.870	12.7

Appendix B

Table B-1. Down Gradient Ground Water Quality for July 2002- July 2007

MW-1	Location	Maximum	Minimum	Mean
	Approximately 200 ft up gradient and northeast of West Pond C			
Chloride		480	185	390
Nitrate plus Nitrite		1.34	0.05	0.715
Nitrogen		0.1	0.1	0.1
Total Kejdahl Nitrogen		4	0.6	1.4
pH		7.3	6.7	6.9
Total Dissolved Solids		1630	850	1187.5
Specific Conductivity		2240	1290	1682.5
MW-3A	Location	Maximum	Minimum	Mean
	Approximately 100 ft to the southwest and down gradient of West Pond A			
Chloride		140	79	102.5
Nitrate plus Nitrite		0.71	0.29	0.44
Nitrogen		0.1	0.1	0.1
Total Kejdahl Nitrogen		2	0.1	0.65
pH		7.6	7.1	7.4
Total Dissolved Solids		617	521	573.5
Specific Conductivity		1060	334	777
MW-4	Location	Maximum	Minimum	Mean
	No longer exists. This well was immediately down gradient of the MDF Pond. This well was demolished when the New clarifier was constructed.			
Chloride		4820	305	320
Nitrate plus Nitrite		0.11	0.05	0.05
Nitrogen		268	217	259
Total Kejdahl Nitrogen		375	277	293
pH		7.5	7.3	7.4
Total Dissolved Solids		3330	2780	2960
Specific Conductivity		5800	4780	4820
MW-5	Location	Maximum	Minimum	Mean
	Immediately south of Log Pond			
Chloride		925	500	800
Nitrate plus Nitrite		0.1	0.005	0.005
Nitrogen		8.8	2.2	4.6
Total Kejdahl Nitrogen		18.2	6.7	10.8
pH		7.2	6.7	6.9
Total Dissolved Solids		2360	1610	2040
Specific Conductivity		3340	2300	3180

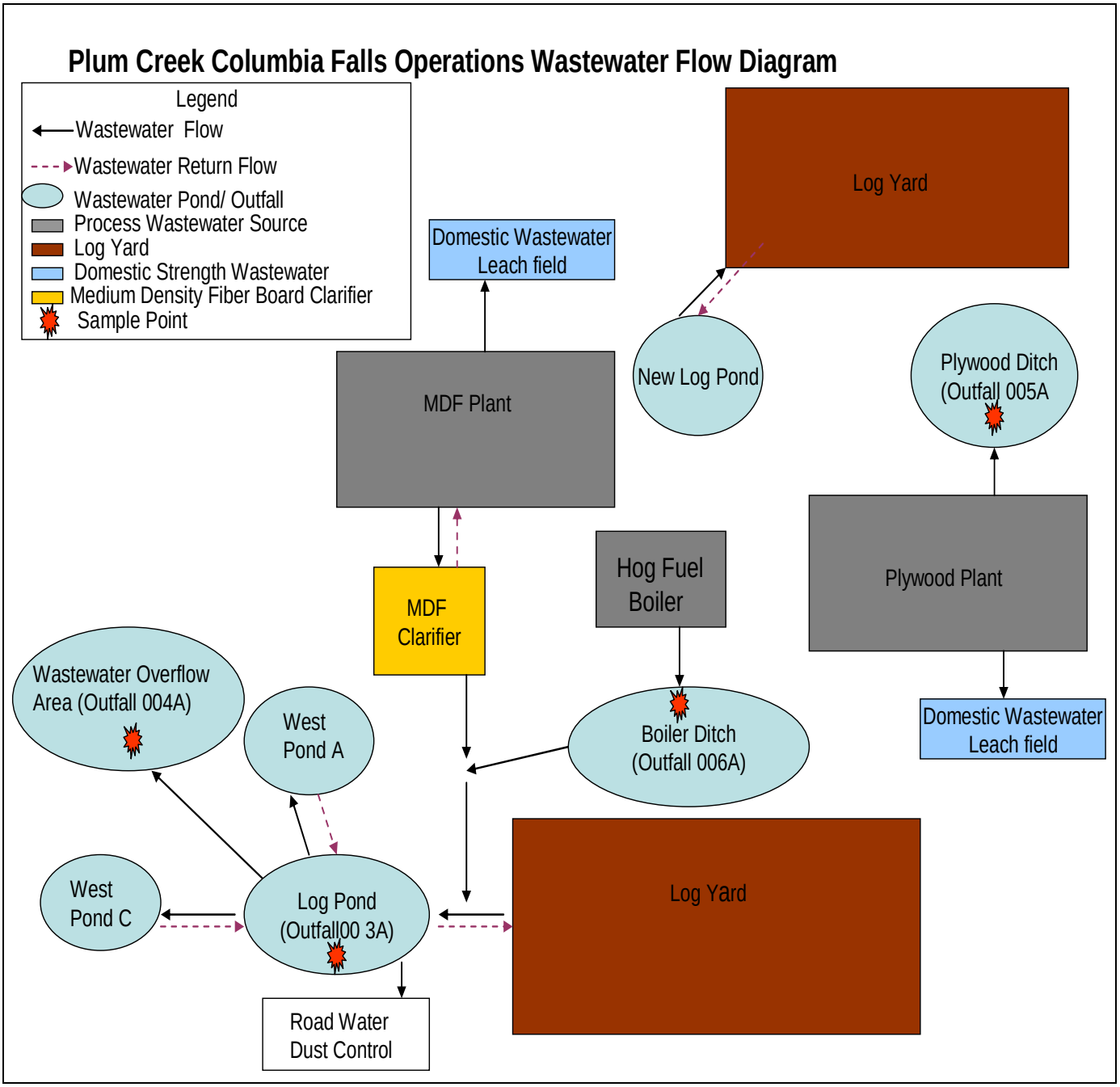

Figure 1 Wastewater Flow Diagram